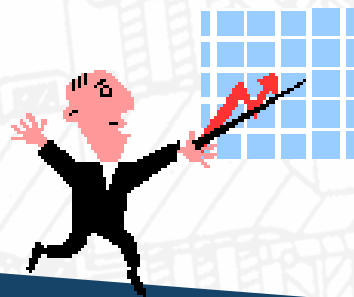


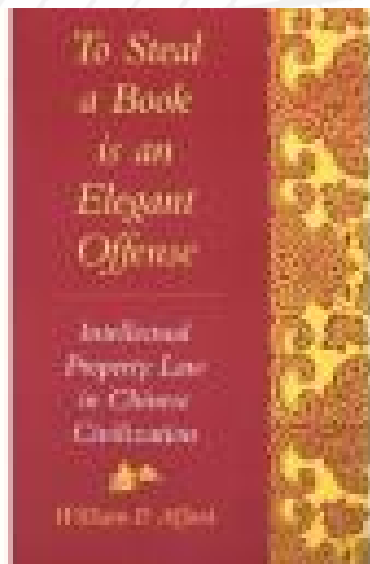
Roads Less Traveled: Using Empirical Data to Revisit Assumptions About IP in China

Mark Cohen

May 2015



The views expressed here in are the author's own and may not represent those of the US government or of any third party.



UNITED STATES
PATENT AND TRADEMARK OFFICE



Intellectual Property Concerns of the Near Past ...



Infringement of the Distant Past...



The correct historical assumptions?



“To steal a book is an elegant offense”

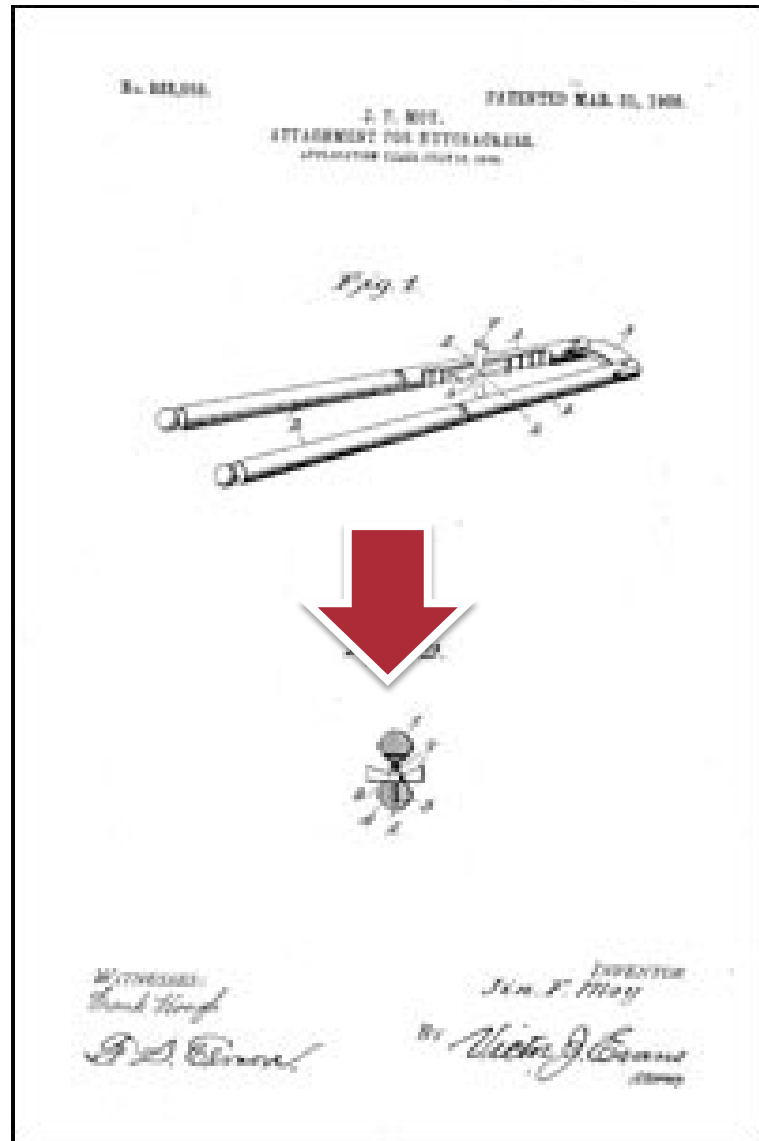


“Study me and live, imitate me and die”

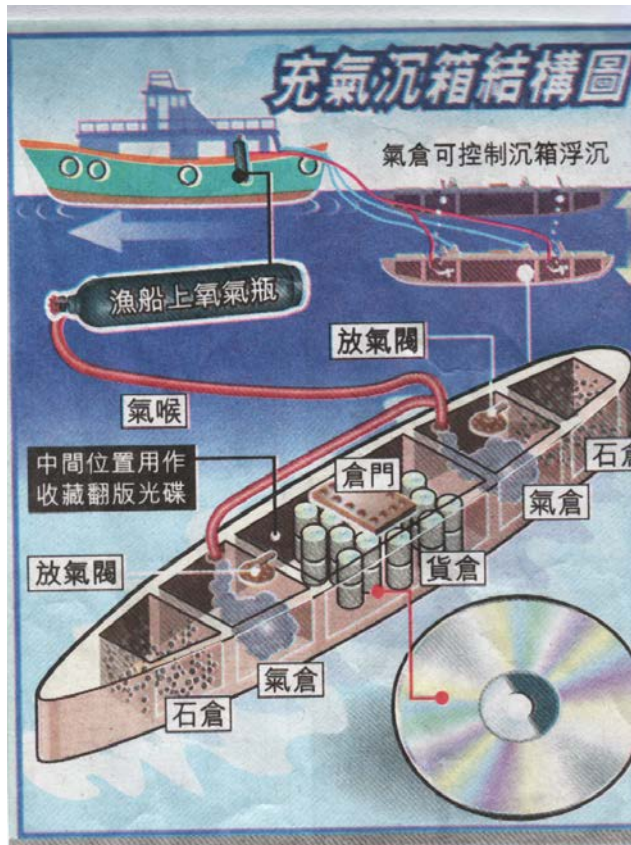
The correct understanding of the role of IP in China?

What were Chinese Traditions? Why?

Dr. Jin Fuey Moy (梅振魁;
Mei Zhenkui, 1862-1924)



The Last Decade: Criminality...



| | | China*/** | US *** /**** |
|------|------------------------------------|-----------|-----------------|
| 2007 | Total IPR Cases | 2684 | 35 |
| | IPR Infringement | 904 | |
| 2014 | Total IPR Cases (+313%) | 11088 | 79 (+126%) |
| | IPR Infringement (+480%) | 5242 | |

* China's criminal IP prosecution includes Patent based criminal prosecution.

** China's criminal IP prosecution case count based on cases filed in ALL local courts. government's prosecutorial office.

*** Fiscal year 2007/2014 data that begin/end in Sept.

**** Federal District Court Filings only.

2007 - WTO IP Customs Case

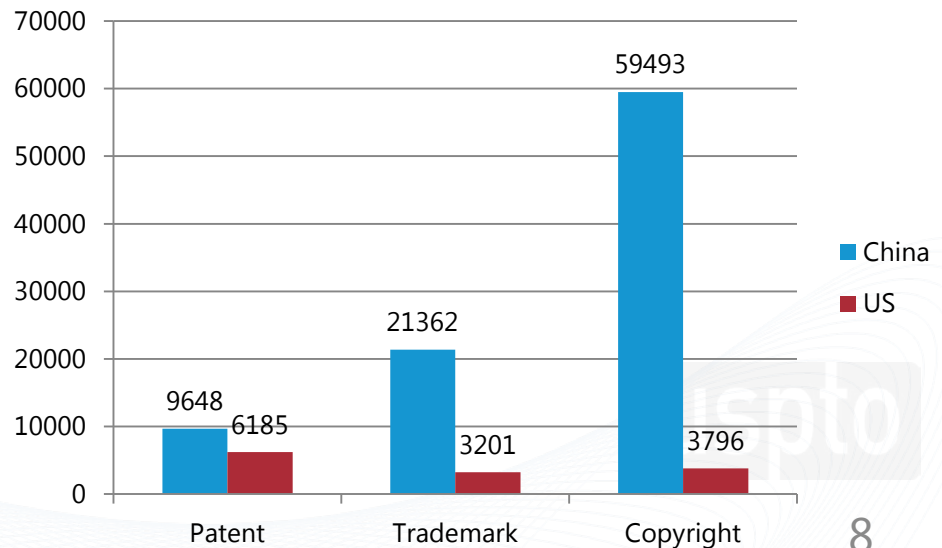
7.232 The Panel will continue to assess the claim insofar as it concerns goods destined for importation. Imports represented 0.15 per cent by value of the goods disposed of or destroyed under the measures at issue in the years 2005 to 2007. During that period, all confiscated infringing imports were either donated to the Red Cross Society of China (0.12%) or destroyed (0.02%).²²⁴ The volume of infringing imports that was sold to the right holder, or auctioned, was zero.

| | | 2005 | 2006 | 2007 | Total |
|----------------------------------|-----------|---------|---------|---------|---------|
| By shipment³³⁸ | | | | | |
| Exports + imports | Auctioned | 4 | 7 | 1 | 12 |
| | Destroyed | 143 | 227 | 248 | 618 |
| By value | | | | | |
| Exports + imports | Auctioned | 7.10% | 3.54% | 0.59% | 3.70% |
| | Destroyed | 92.90% | 96.46% | 99.41% | 96.30% |
| Imports only | Auctioned | 0% | 0% | 0% | 0% |
| | Destroyed | 100.00% | 100.00% | 100.00% | 100.00% |

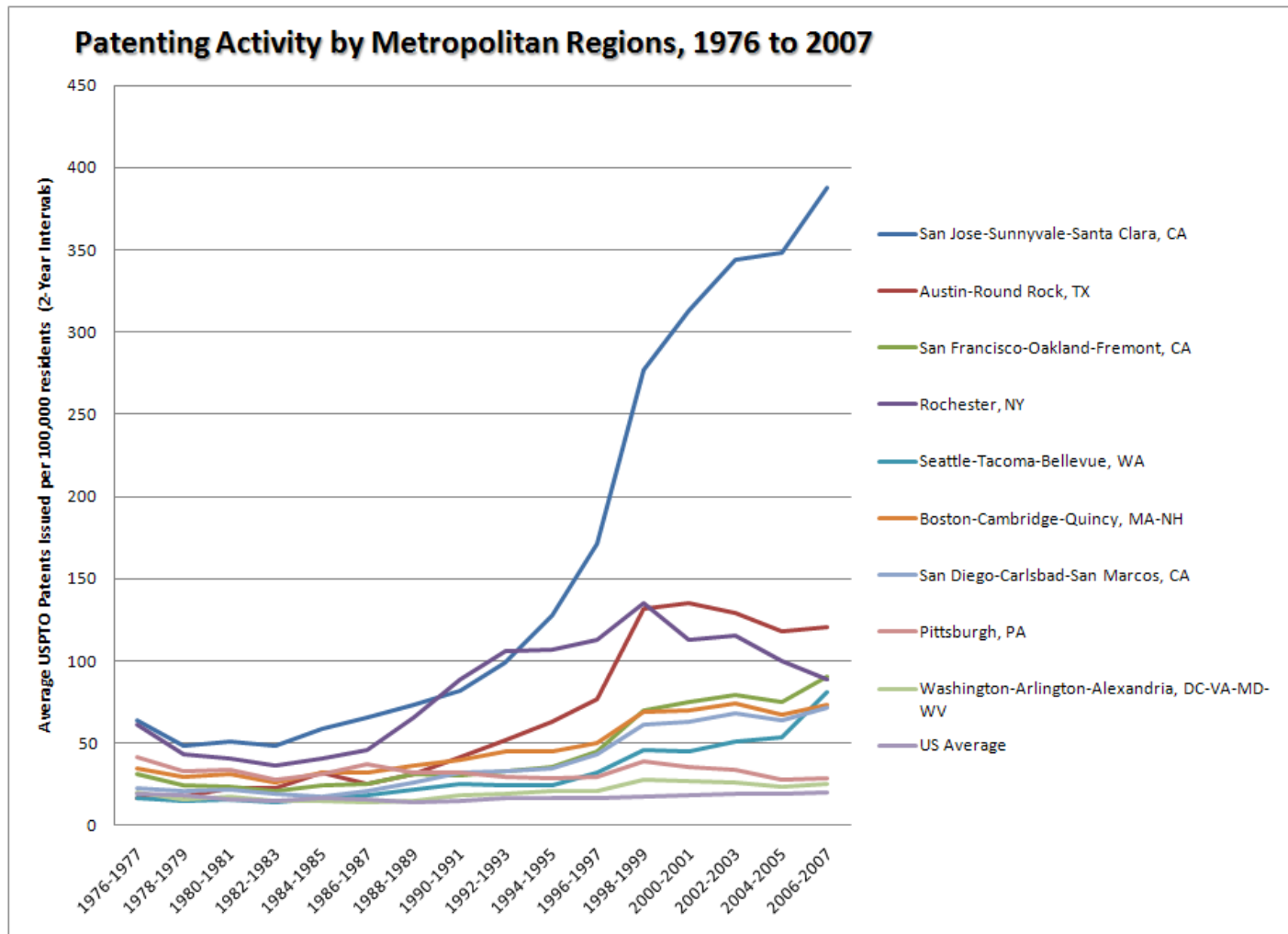
Assumption 1: “There remains a need to foster rights consciousness” (Alford, p. 117)

- Most litigious society for IP in the world
- Largest trademark, patent, plant variety, etc. offices
- High patent/TM rights per capita does not necessarily mean high protection.

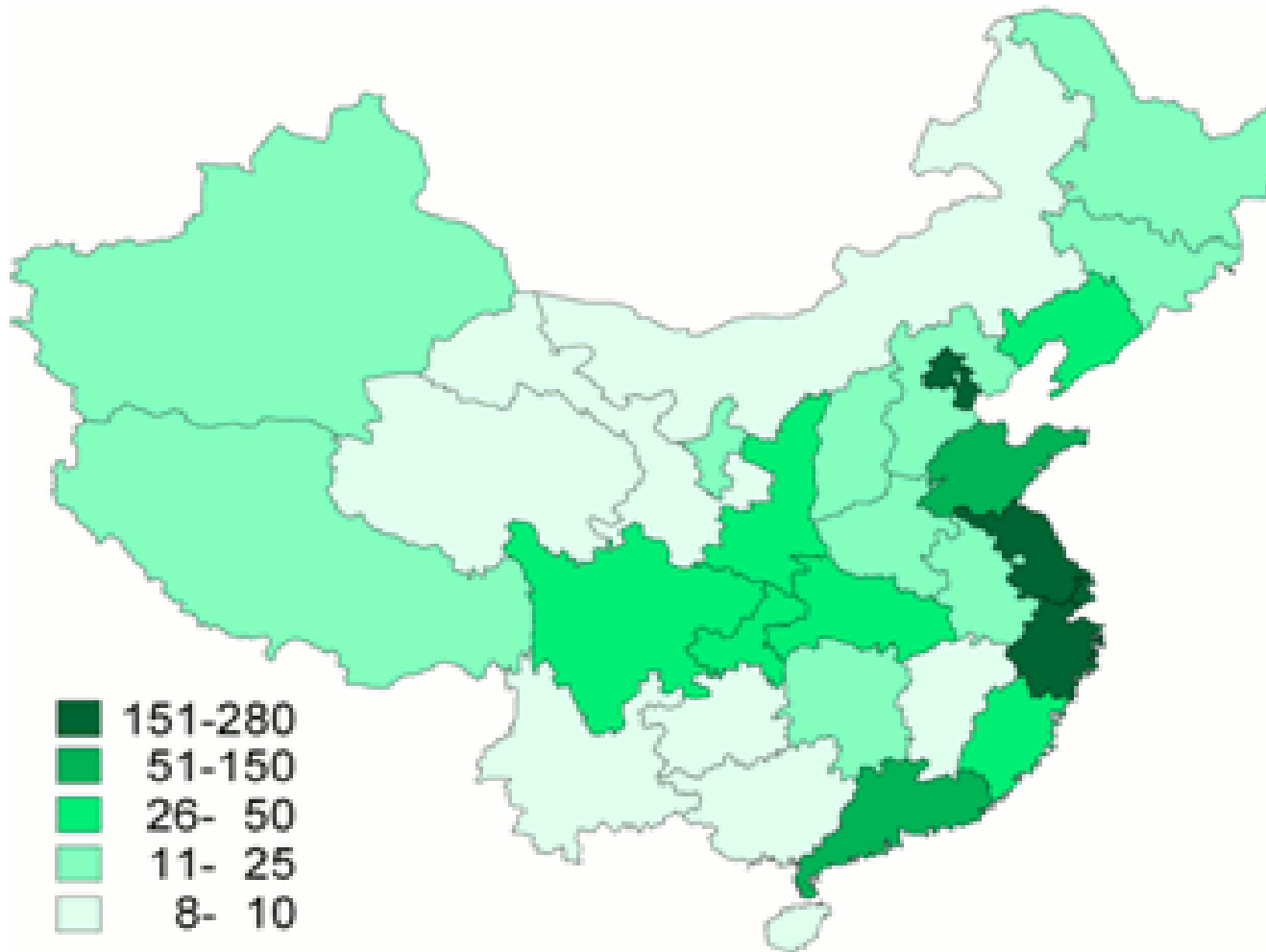
2014 China/US
Litigation
Dockets



Regionality: Distribution of Patents in the US



China Patenting Distribution



Patents per 1,000 persons by Chinese province (per 'Have Chinese innovators (and banks) finally grown-up?', Aoife Hanley, Wan-Hsin Liu, Andrea Vaona, 24 Mar 2011).



What Data to Use For “Rights Consciousness” and “Satisfaction”

- Chinese government surveys
- Media Programs
- Attorneys/IP Professionals Density
- US government surveys (comparative ie on patent ownership)
- IPO data on patent ownership
- Chinese Institute of Publishing Sciences Survey (**中国出版科学研究所**)
- Patent/TM ownership, applications per capita/GDP
- Litigation per capita/GDP
- Comparison IP/Non IP comparisons on litigation
- Training Programs
- Educational Programs
- Budget/expenses on elevating rights consciousness
- Comparative data
- Information Utilization (eg., website hits, visits, etc)

Chinese Surveys on Rights Consciousness and Satisfaction

- SIPO's 2011 Rights Consciousness Survey revealed general IP rights awareness at 92%, Patent rights at 87%, Trademark rights at 79%, and Copyright at 65%.
- SIPO's 2014 IP protection satisfaction survey based on legal and policy protection, enforcement, management and service, and education outreach factors reviewed 65% satisfaction.

China aims to reach 6 patents per 10,000 by 2015. What State will China Statistically Resemble?



China aims to reach 14 patents per 10,000 by 2020. What State will China Statistically Resemble?

- California, U.S. State with highest per capita patent ownership rate, comes closest at 11.4 patents per 10,000 residents.



China's 2014-2020 IP Metrics

| Targets | 2013 | 2015 | 2020 |
|------------------------------------------------------------------------------------|-------|------|------|
| Per 10,000 patent ownership rate | 4 | 6 | 14 |
| Patent Applications filed under PCT (10,000) | 2.2 | 3 | 7.5 |
| Domestic invention patent average maintenance duration (years) | 5.8 | 6.4 | 9 |
| Copyright Registration Volume (10,000) | 84.5 | 90 | 100 |
| Computer Software copyright registrations (10,000) | 16.4 | 17.2 | 20 |
| Total Technology based contracts (Trillion Yuan) | 0.8 | 1 | 2 |
| IP financing annual amount (100 million Yuan) | 687.5 | 750 | 1800 |
| Patent royalty revenue to foreign companies (100 million US Dollars) | 13.6 | 20 | 80 |
| IP services revenue annual growth rate (%) | 18 | 20 | 20 |
| IP protection satisfaction rate (points) | 65 | 70 | 80 |
| Average length of substantive examination of invention patent application (months) | 22.3 | 21.7 | 20.2 |
| Average length of Trademark registration review period (months) | 10 | 9 | 9 |

Information Flow – SIPO Hits

| Rank | Visitor's Country | Views | Percentage of total visits |
|------|-------------------|-----------|----------------------------|
| 1. | China | 632690537 | 71.57% |
| 2. | Europe | 98993196 | 11.20% |
| 3. | IANA | 35616307 | 4.03% |
| 4. | United States | 8389181 | 0.95% |
| 5. | Japan | 2265222 | 0.26% |

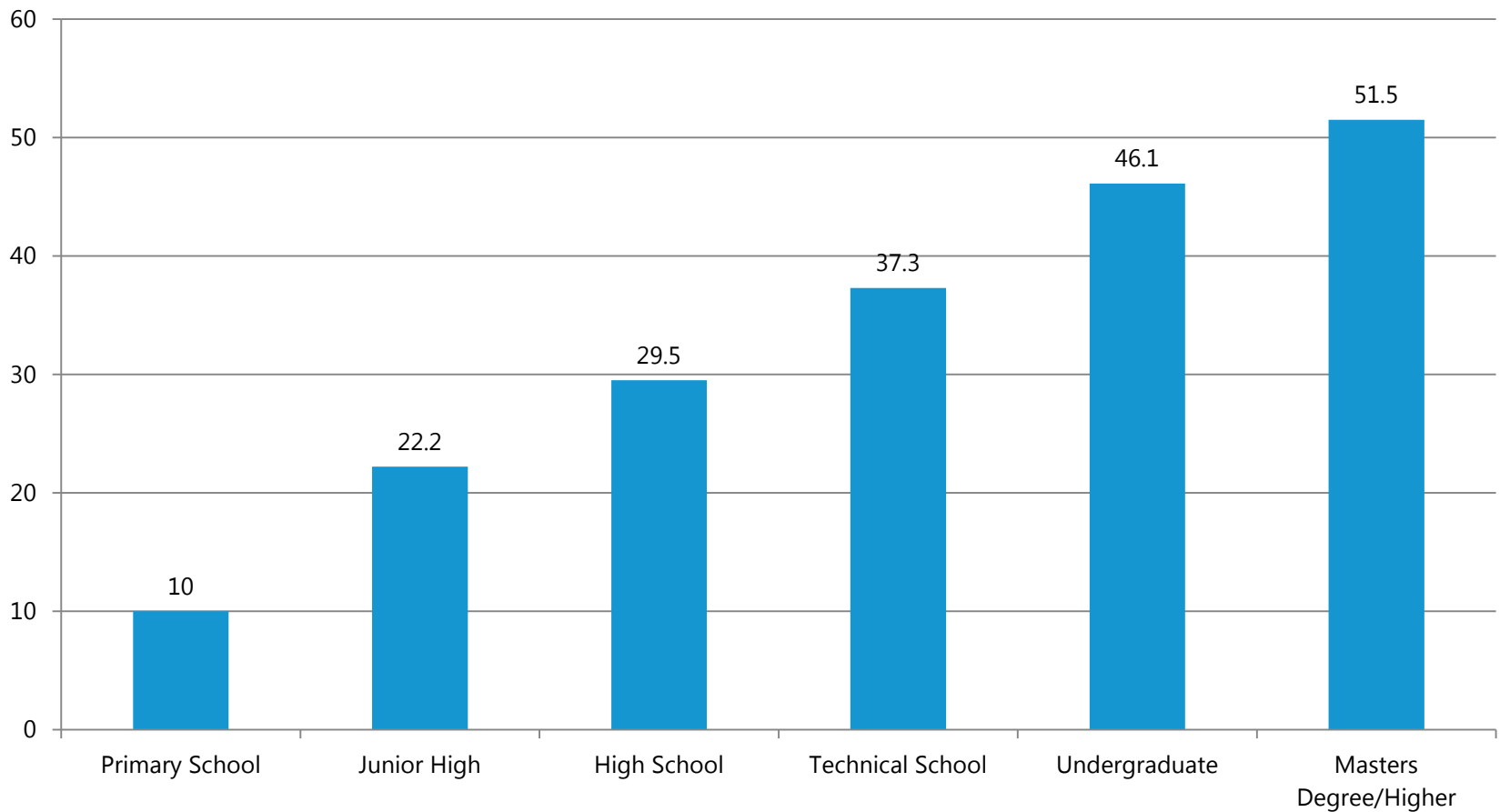
Chinese Language Hits – from 2012

| Rank | Visitor's Country | Views | Percentage of Total Visits |
|------|-------------------|---------|----------------------------|
| 1 | China | 2081650 | 80.01% |
| 2 | United States | 230659 | 8.87% |
| 3 | Europe | 78356 | 3.01% |

English Language Hits – from 2012

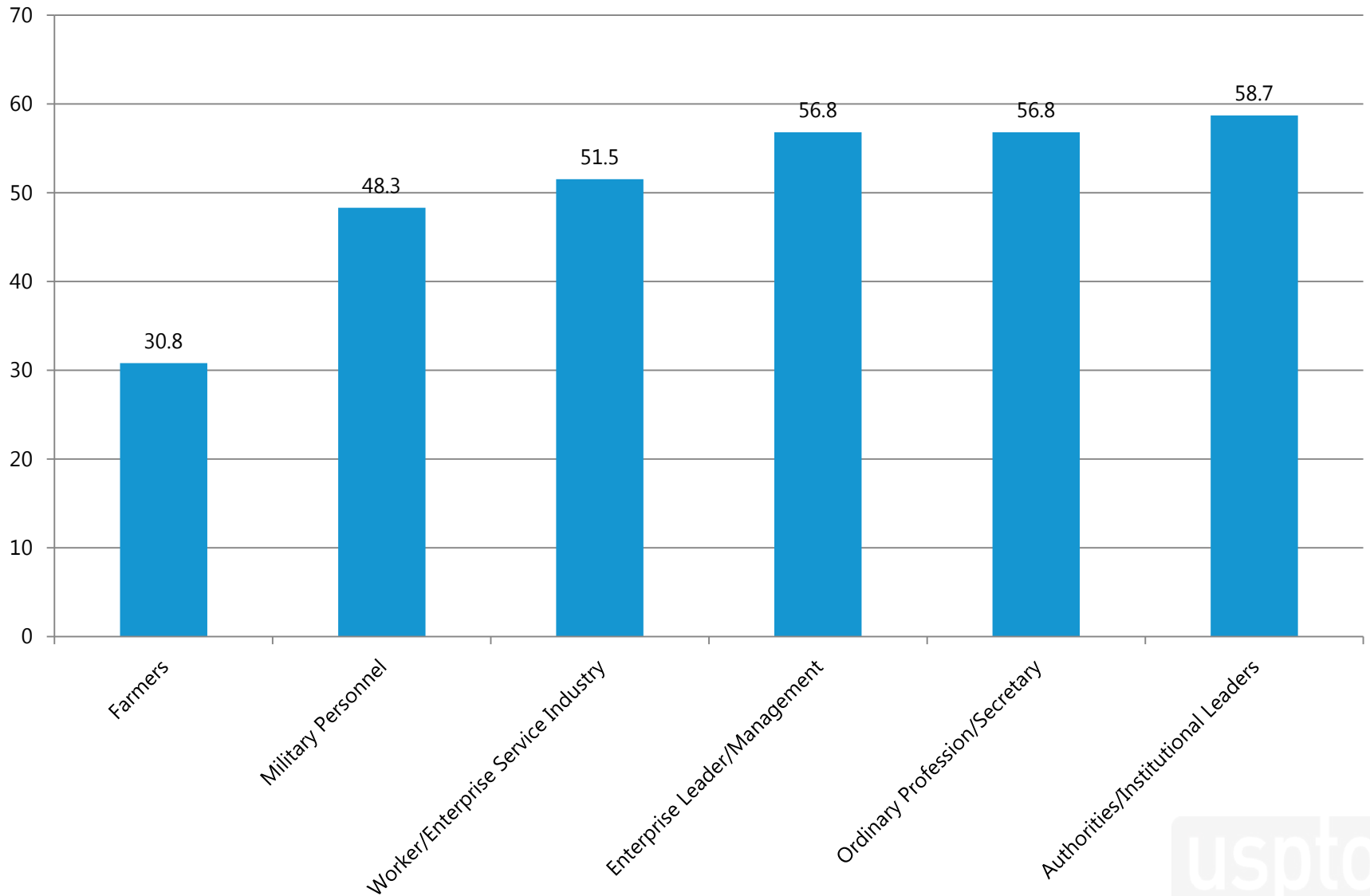


Tendencies to Buy Pirated Goods by Education Level



Source: Chinese Institute of Publishing Sciences, National Reading Survey (2008, 09).

Tendencies to Buy Pirated Goods by Profession



Assumption 2: "Serious protection of IP must await...the development of Chinese generated IP" (p. 123)

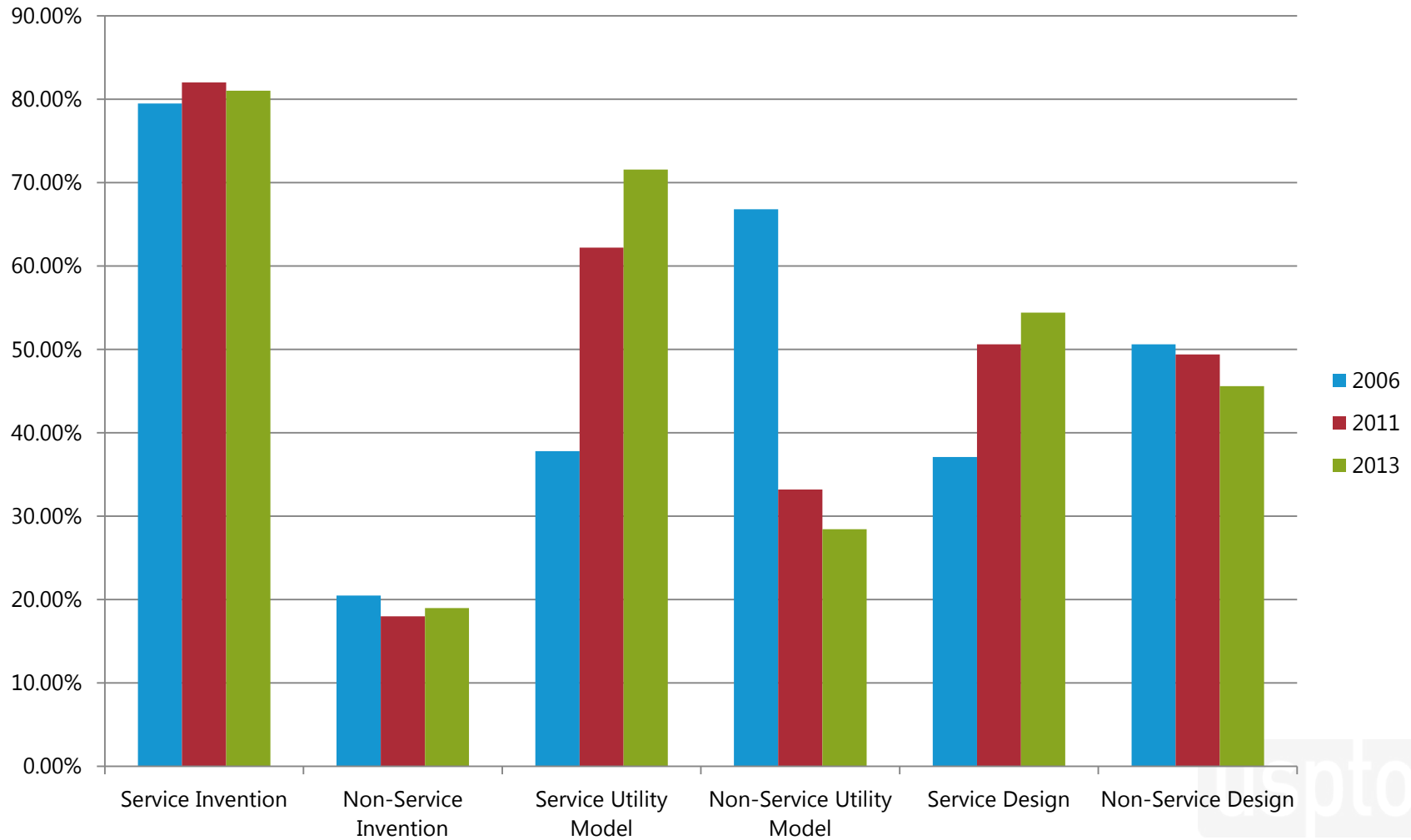
Patent Applications - 2013

| | | Invention | | Utility Model | | Design | | Total | |
|----------|-------------|-----------|-----------------|---------------|-----------------|--------|-----------------|---------|----------|
| | | Number | % | Number | % | Number | % | Number | % |
| Total | Subtotal | 825136 | 100.00% | 892362 | 100% | 657582 | 100% | 2375080 | 100% |
| | Service | 688727 | 83.47% | 640112 | 71.73% | 365007 | 55.51% | 1693679 | 71.31% |
| | Non-Service | 136409 | 16.53% | 256598 | 28.75% | 294572 | 44.80% | 683382 | 28.77% |
| Domestic | Subtotal | 704936 | 100/85.4 | 885226 | 100/99.2 | 644398 | 100/97.7 | 2234560 | 100/94.0 |
| | Service | 571073 | 81.01% | 633446 | 71.56% | 350551 | 54.40% | 1555070 | 69.59% |
| | Non-Service | 133863 | 18.99% | 251780 | 28.44% | 293847 | 45.60% | 679490 | 30.41% |
| Foreign | Subtotal | 120200 | 100/14.6 | 7136 | 100/0.8 | 15165 | 100/2.3 | 142501 | 100/6.0 |
| | Service | 117654 | 97.88% | 6666 | 93.41% | 14456 | 95.32% | 138609 | 97.27% |
| | Non-Service | 2546 | 2.12% | 4818 | 67.52% | 725 | 4.78% | 3892 | 2.73% |

However - Higher Proportion of Small Inventors Than the U.S.

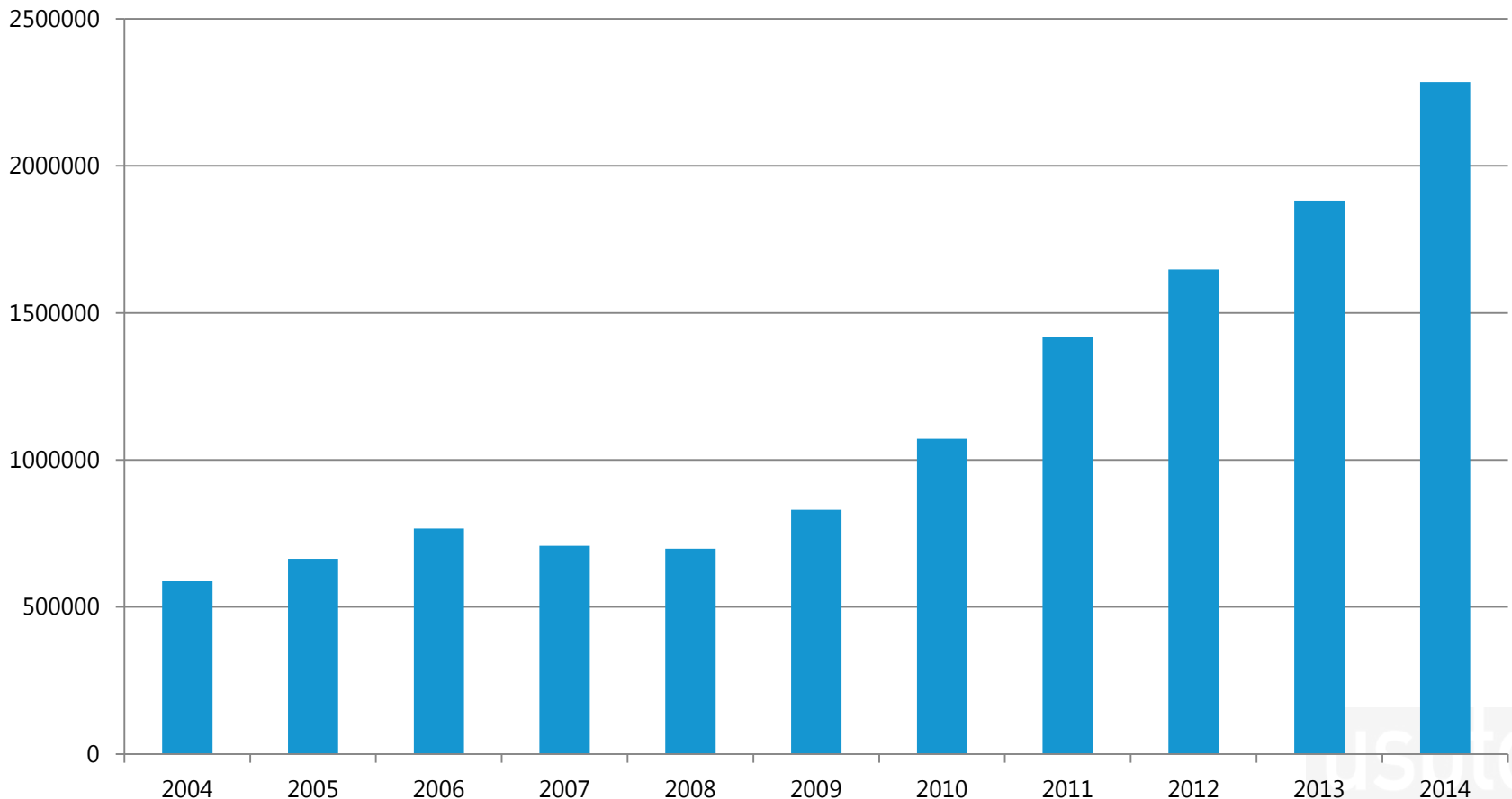
- *U.S. Percent of Patents (2014)*
 - **U.S. CORPORATION** 45.3%
 - **U.S. GOVERNMENT** 0.3%
 - **FOREIGN CORP.** 47.8%
 - **FOREIGN GOVT** 0.1%
 - **U.S. INDIVIDUAL** 4.6%
 - **FOREIGN INDIVID.** 1.8%
- *China (2013)*
 - **INVENTION PATENTS -**
 - **SERVICE INVENTIONS** 88.4%
 - **NON-SERVICE INVENTIONS** 11.6%
 - **DESIGN PATENTS**
 - **SERVICE** 58.6%
 - **NON SERVICE** 41.4%
 - **UTILITY MODELS**
 - **SERVICE** 74.6%
 - **NON SERVICE** 25.4%
 - **Average/Non Service: 29.0%**
- (http://www.uspto.gov/web/offices/ac/ido/oeip/taf/topo_14.htm#PartA1_2b)

SIPO Patent Filings Comparison 2006 vs. 2011 vs. 2013



Trademark Filings: Highest in the World for Over 10 Years

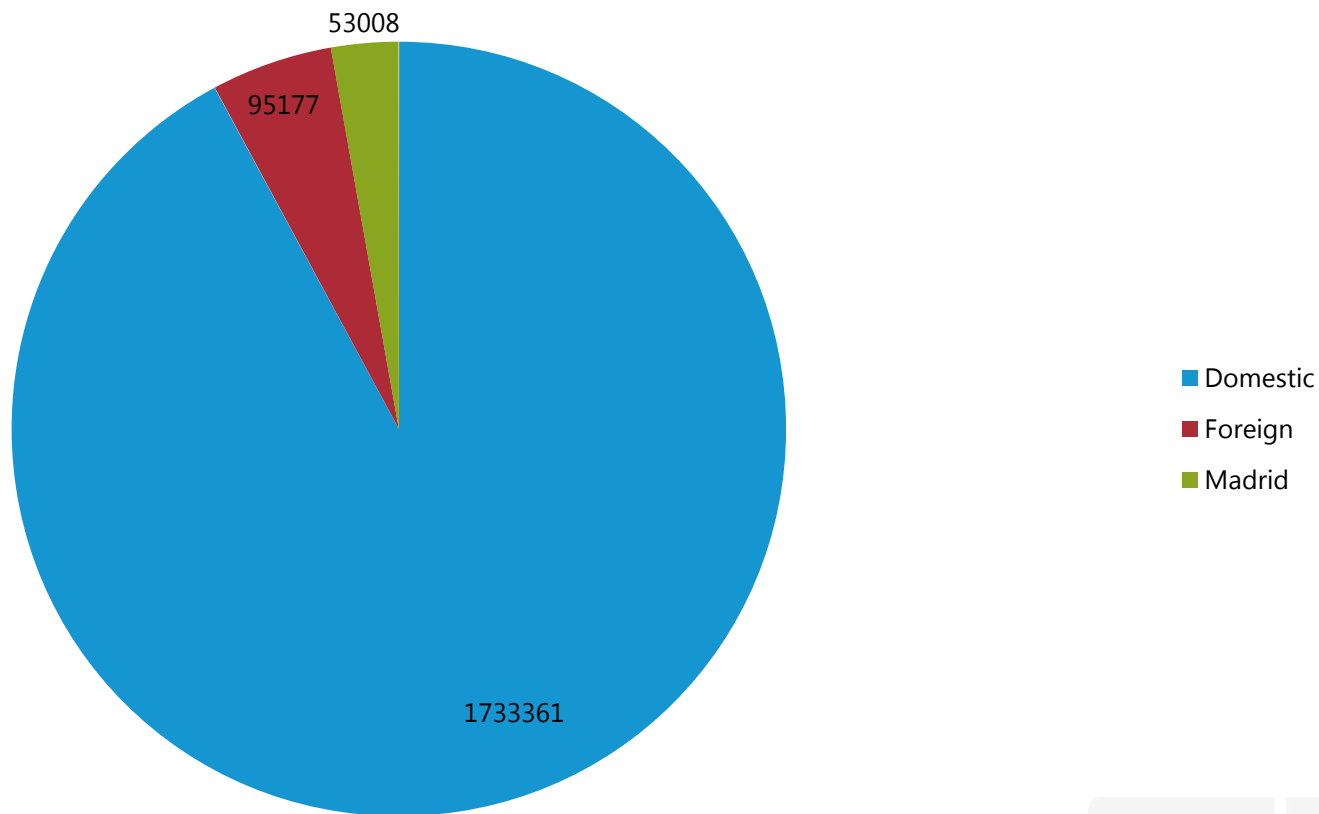
China Trademark Application Filings



2014 US Residents Filings: 872759

Chinese Trademark Applications - 2013

2013 Application Breakdown



Effect of the Market: “Bayh-Dole” and Patent Quality

| University | Patent Applications | Invention Patent % | Enterprise | Patent Applications | Invention Patent % |
|----------------------------|---------------------|--------------------|------------|---------------------|--------------------|
| Tsinghua | 4977 | 91.31% | Huawei | 23585 | 95.91% |
| Zhejiang U. | 4284 | 79.73 | ZTE | 14747 | 93.2 |
| Shanghai Jiaotong | 3079 | 96.85 | BYD | 3997 | 40.24 |
| Peking U. | 2202 | 90.97 | Haier | 2999 | 47.29 |
| U. of Electron. Technology | 1989 | 82.82 | Lenovo | 2358 | 73.18 |
| Southeastern U. | 1946 | 76.63 | Haisense | 2092 | 30.6 |
| Fudan U. | 1717 | 86.58 | Midea | 1934 | 14.72 |
| Huazhong S&T | 1499 | 76.37 | Tencent | 1649 | 100 |
| Haerbin Ind. U. | 1416 | 91.52 | Datang | 1615 | 94.8 |
| Xi'an Jiaotong | 1284 | 92.55 | Vimicro | 1497 | 92.52 |

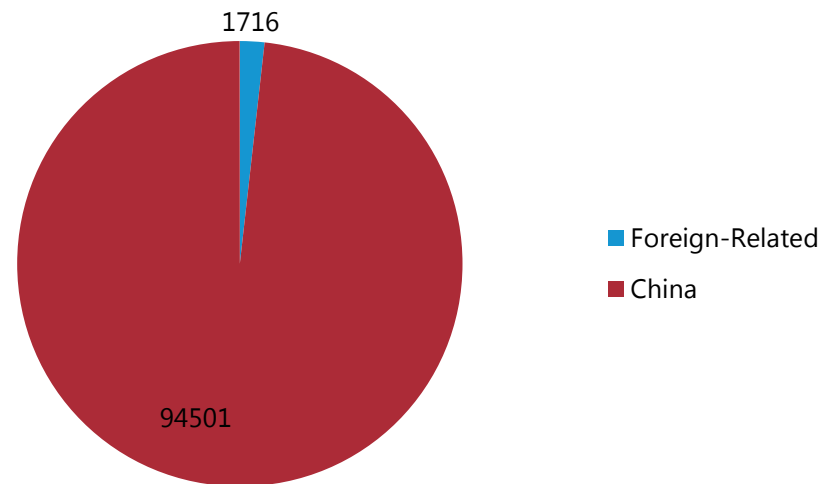
Source: Orcutt and Shen, Shaping China's Innovation Future

Chinese Generated IP: What Benchmark?

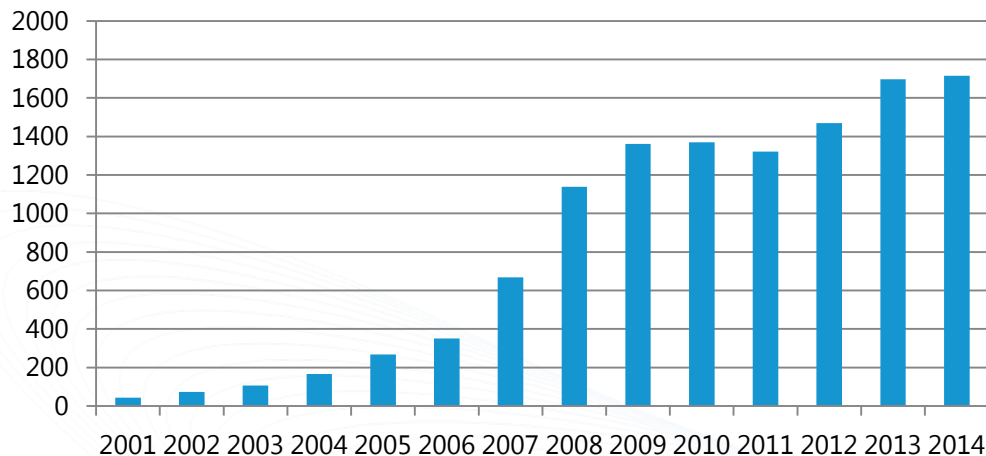
- Patents/TM filings
- Litigation by Chinese entities
- Copyright registrations
- Plant Variety Protection
- Use of Bayh Dole type measures by research institutions
- Use of Measures to protect t/secrets
- Relationship Between Ownership of IP and Protection – Comparisons to Litigation Data
- Overseas filing/litigation data by Chinese entities
- Areas of protection, types of protection and other quality indicia (citation data)
- SFDA Chinese-origin filings
- Dispersion of ownership – to show breadth of engagement

Assumption 3: “It is inconceivable that a system designed to protect [foreigners] and not [Chinese] could be sustained in China.” (Alford, p. 119)

Foreign Related Civil IPR Cases/Total IPR Cases 2014

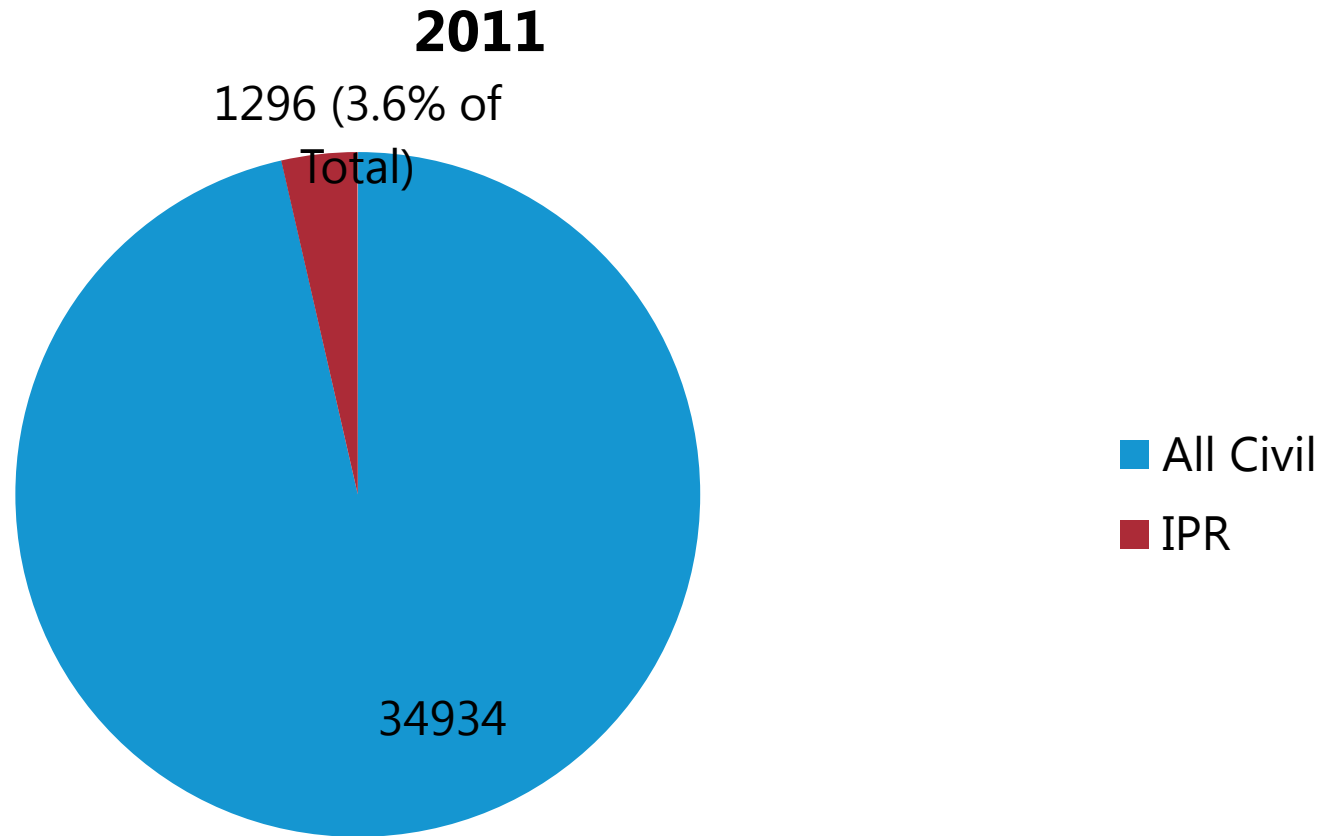


Foreign Related IPR Civil Cases



Foreign cases were 1.8% of the 2014 docket

Foreign Civil Cases : How Significant a Share Is IPR?



Is this Assumption Flawed: Nationality of Ownership - the US

- Four of Big Six Publishers
Are Foreign-Owned
- Four of the Five Largest Science, Technical, Medical Publishers are Foreign-Owned
- Of the top ten best-selling fiction authors in the US, five are foreign.
- Two of the three major record labels are foreign.
- In 2013, Oscar Winners in 13 of the 24 categories were foreign.
- In 2014, foreign residents obtained 6185 more US patents than US residents.

Data on Collaboration

- Overseas Filing Data by Chinese enterprises (e.g., Microsoft China in the US)
- Sino-Foreign patent applications/research studies
- Joint venture and cooperative R&D formation
- Inbound and outbound licensing data
- Venture Capital/non-technical cooperative data
- What is foreign-related litigation? /Defining Foreign-involvement increasingly difficult.

Role of Foreign-Funded Enterprises in China: Chemical medicine and Bio Manufacturing

- Generally, more rapid growth, but still lower absolute numbers than large and medium sized Chinese enterprises.
- R&D Personnel (*most rapid growth – 2000-2010*)
 - Chemical Medicine: 665 – 6,111
 - Manuf. Biological and Biochem: 109 -545
- New Product Development
 - Chemical Medicine: 15,785 – 213,583 (*most rapid growth*)
 - Biological and Biochem: 2,315-17,148 (number 2)
- Patent Applications
 - Chemical Medicine: 13 – 509 (*most rapid growth*) (3,815%)
 - Biological and Biochemical: 6 – 91 (*most rapid growth*)
 - *Globally: pharma patent applications have been declining since 2007 (WIPO)*
- Patents in Force
 - Chemical Medicine: 5 – 555 (*most rapid growth*)
 - Manufacture Biological and Biochem (1 – 62, **dropping** from a peak of 159 in 2008).

Source: 2011 China Statistics Yearbook on High Technology Industry.
http://www.wipo.int/pressroom/en/articles/2012/article_0025.html#3

Role of Chinese Investment in the US

- Between 2000-2013, Chinese investments in the High-Tech Industries** has totaled over \$9 billion dollars.
- In the first three months of 2014, almost \$6 billion dollars of investments has been announced or completed***.

** Aerospace Equipment and Components; Automotive Equipment and Components; Other Transportation Equipment; Chemicals; Renewable Energy; Financial Services and Insurance; Business Services; Pharmaceuticals and Biotechnology; Plastic, Rubber, and Other Materials; Health Care and Medical Devices; Industrial Machinery and Tools; Electronics and Electronics Parts; IT Equipment; Software and IT Services; Semiconductors

*** MicroPort Scientific's purchase of Wright Medical's OrthoRecon; Lenovo's acquisition of IBM's low-end server business; Lenovo's acquisition of Motorola Mobility Assets; Shenzhen Hepalink Pharmaceutical's takeover of Scientific Protein Laboratories; and Wanxiang's acquisition of Fisker.



Example- Pharmaceutical

- 187 Chinese-origin novel therapeutics are in clinical trials (2011)
- 2/3 are in phase 1 clinical trials.
- Oncology, cardiovascular and infectious diseases are main areas.
- 70 have compound patent protection in China and 23 have compound protection in US, 16 in the EU, 8 in both markets.

Source: Qi et al, Innovative Drug R&D in China, May 2011.
(http://download.bioon.com.cn/view/upload/201112/13233716_2098.pdf)

Counter-Cyclical Trends

- Expenditure for Acquisition of Foreign Technology
 - Manufacture of Chemical Medicine
 - 28040 (2000) vs. 39192 (2010) (Increase of 40%)
 - Manufacture of Biological and Biochemical Chemical Products
 - 7353 (2000) vs. 5255 (2010) (DECREASE OF 29%)
 - Large and Medium Enterprises

Assumption 4:

“ [T]he most important factor in explaining the late appearance and relative insignificance of the idea of intellectual property in the Chinese world lies in what, for lack of a better term, we might describe as its political culture...”(p. 119)

Contra:

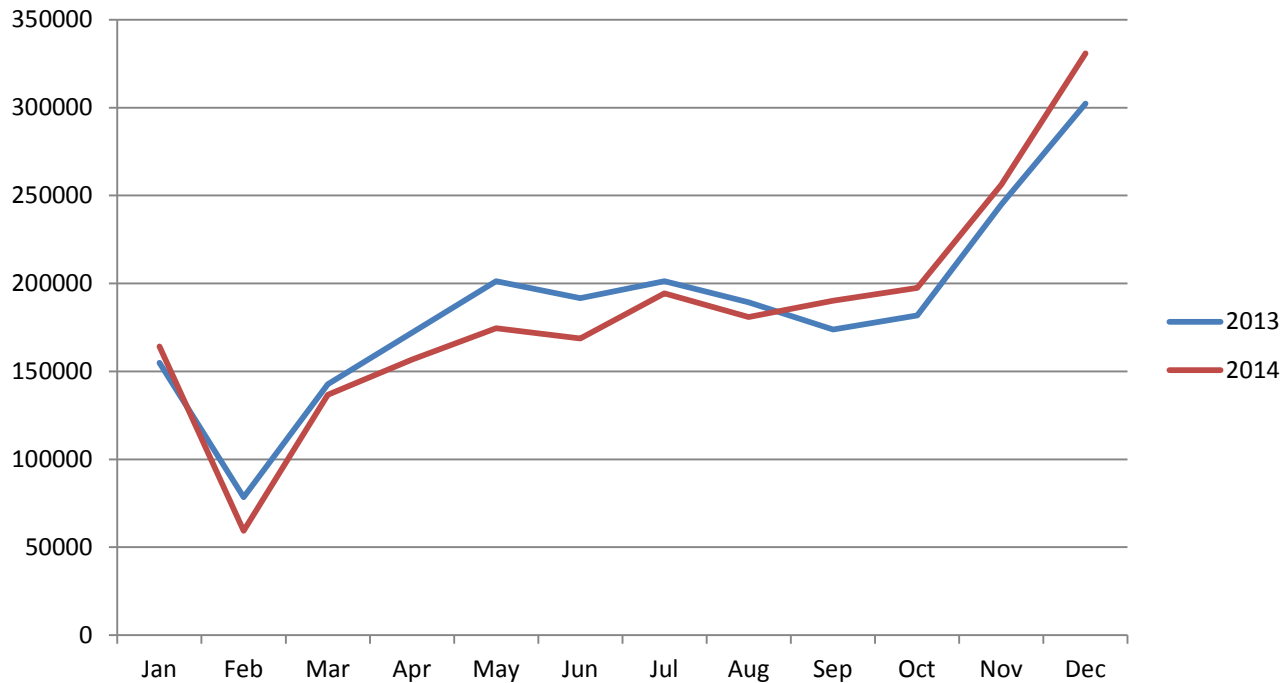
- **“The future competition in the world is in intellectual property.”**

Other Data (Besides Political Statements)

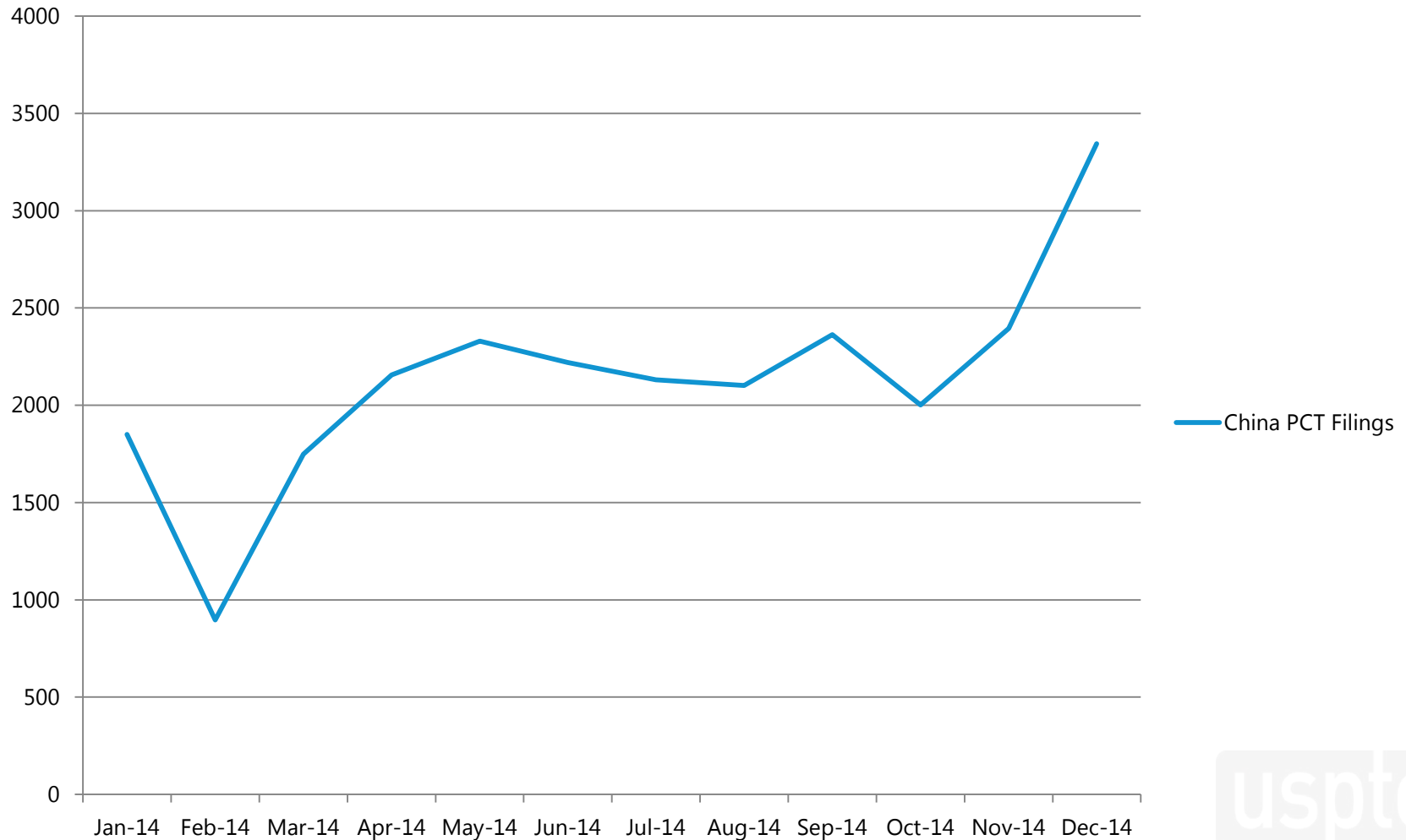
- Government intervention into private ownership of IP
 - Administrative enforcement, criminal, antitrust
- Government willingness to support private rights holders in seeking redress
 - Litigation data

A Government Management Approach to IP?

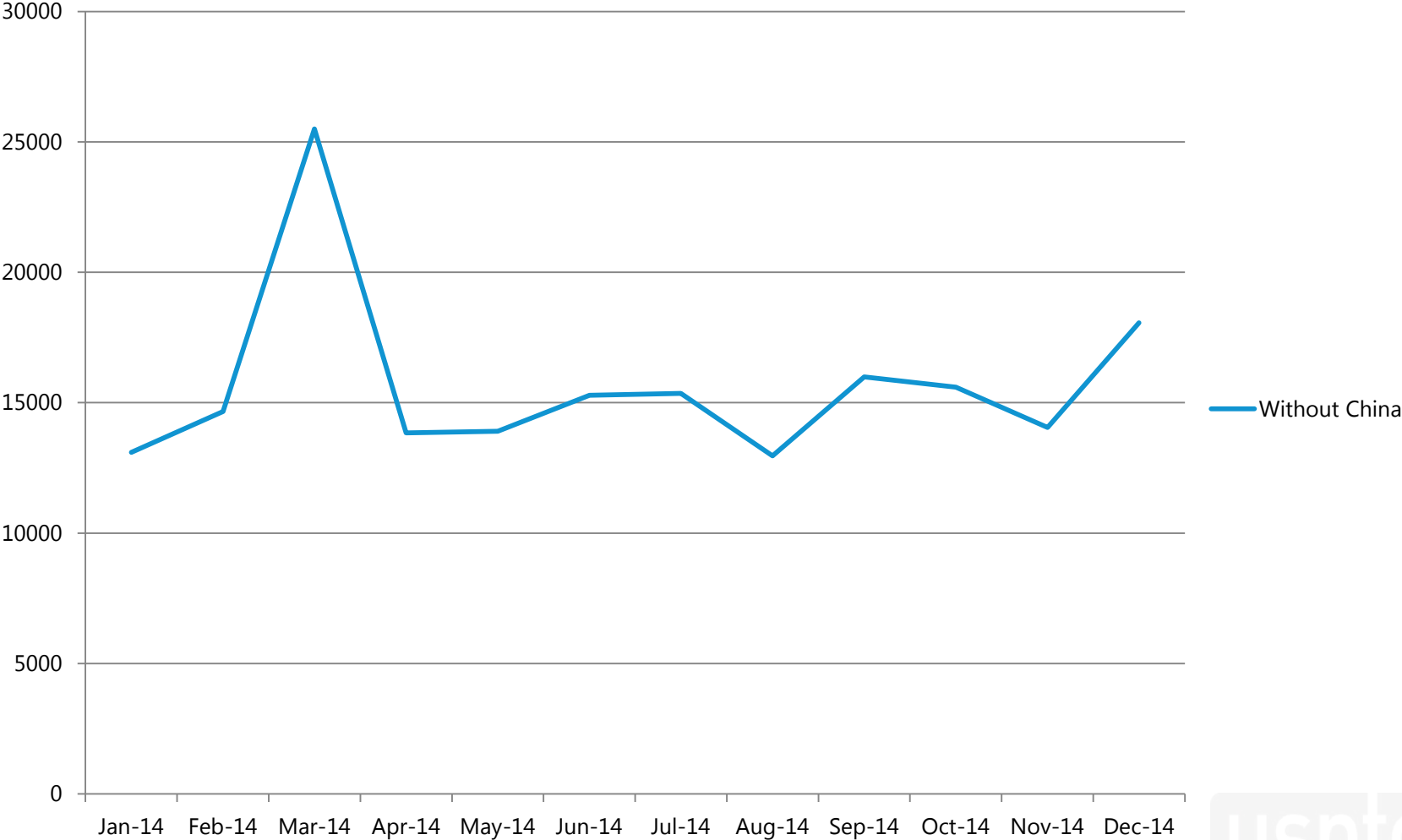
Total Chinese Patent Application Filings by Domestic Applicants



2014 China PCT Filings



2014 WIPO PCT Filings less China*



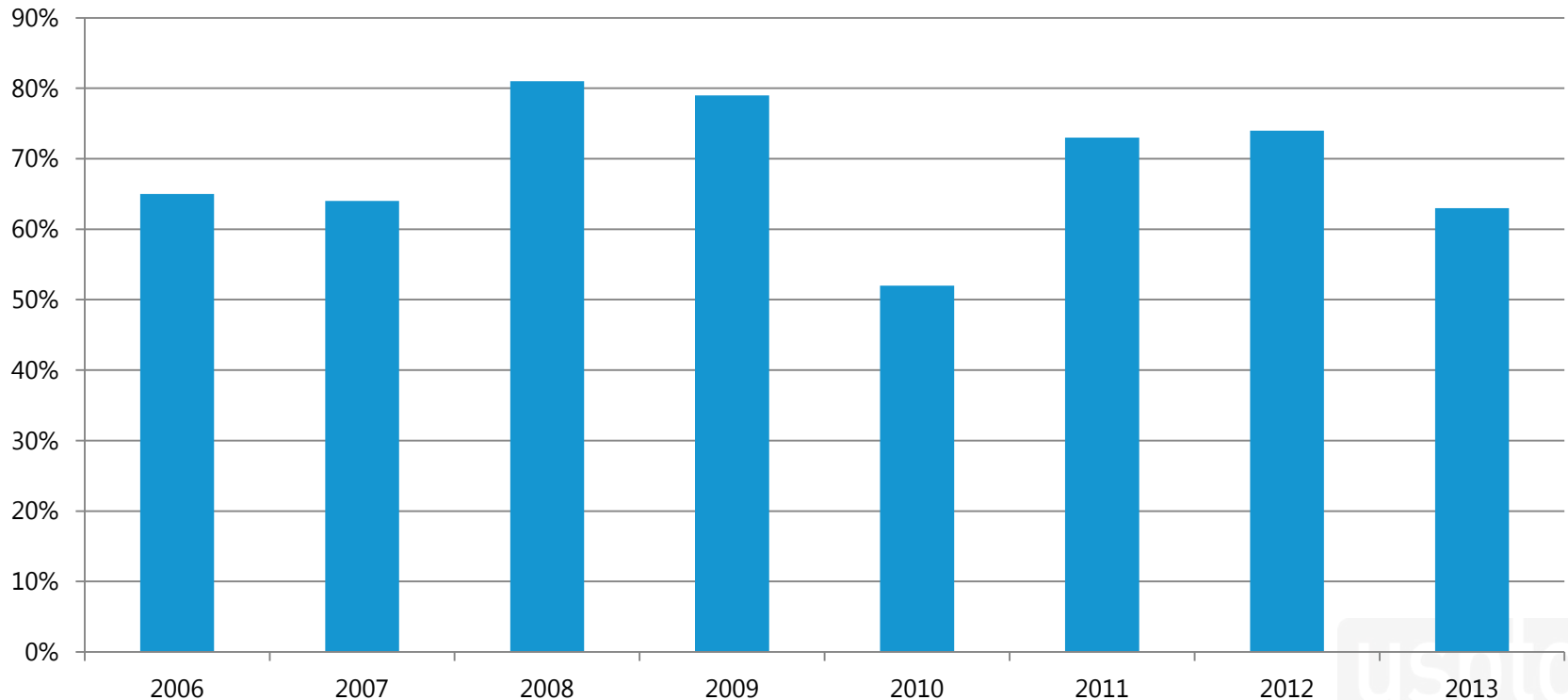
- Mar 2014 is 1 year after the implementation of AIA's First Inventor to File in the US, and corresponds with the surge of US National Filings from Mar 2013.



Duration and Injunctions: Invention Patents - China

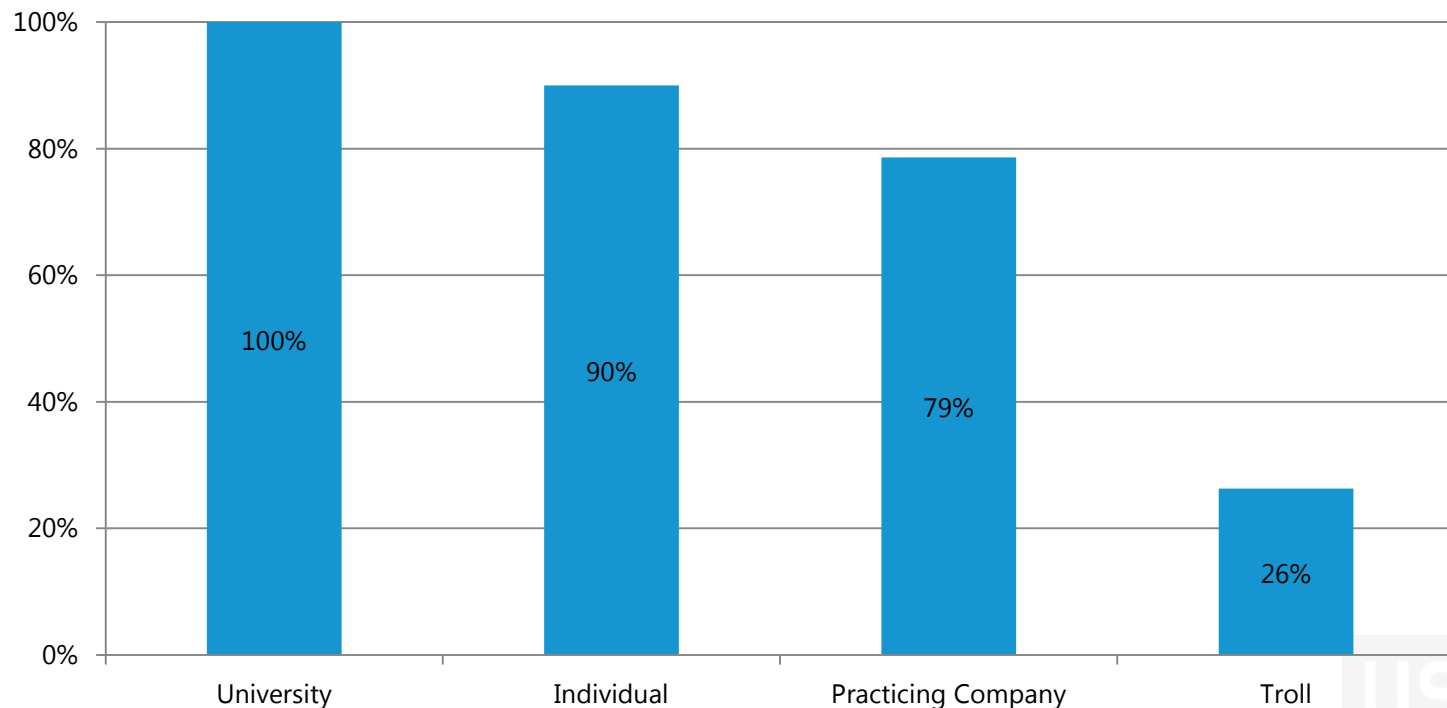
Chinese Injunction Ratios Have Varied from 52% to 81% from 2006-2013

Injunction Ratio



INJUNCTIONS IN THE UNITED STATES

Likelihood of obtaining an injunction after *eBay v. MercExchange* (U.S. 2006)



Source: Chien & Lemley, *Patent Holdup, the ITC, and the Public Interest*, **Cornell L. Rev.** (2012)



Gleevac (Imatinib) in China

- 3 Brands
- Novartis Pharma Stein Ag patent protection on the base compound expired in April, 2013 in China.
- 14 approved generic manufacturer
 - 1 generic manufacturer received approval for clinical trial
 - 13 are for manufacturing
- 31 additional generic applicants
 - 5 are for imported compound, 26 are for domestically produced compound.

Human Resources – Example - SFDA Backlog

- SFDA Patent Examination Center Employees 120 (2008), 120 (2010)
- Clinical Trial Applications
 - 710 (2008), 916 (2010)
- Clinical Trial Approval Time:
 - China: 10 – 18 months
 - India: 4 Months
 - Singapore: 2 Months
 - US: 1 Month
- Other HR Oriented Studies: Andrew Mertha, “The Politics of Piracy: Intellectual Property in Contemporary China” (2007); and Martin Dimitrov, “Piracy and the State: The Politics of Intellectual Property” (2009).

SFDA Backlog - 25th JCCT Consensus (2014)

- China agreed to accelerate reform of the medical device and pharmaceutical regulatory review and approval system, and eliminate the drug application backlog within 2-3 years through adding of personnel and funds, streamlining relevant mechanisms, and increasing the speed of review.

What China Can Offer on Innovation and IP Studies?

- Geographical Correlations
- Cross Ministry Comparisons (e.g. R&D to patenting)
- Relationship between FDI and type of FDI and IP
- Role of foreigners in innovation
- Environment for collaboration
- Education/Social awareness
- Enforcement and IP Acquisition – Relationship
- Employment and Employer Relations and Innovation
- Impact of government policies – e.g. patent subsidies
- Use of national benchmarks to drive IP awareness/ acquisition
- Relationship of private (civil) enforcement to public (administrative/criminal) enforcement
- Role of international obligations/behavior of the courts

THE END

Mark.cohen@Uspto.gov



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